

WATCH OUT *for* Yellow Starthistle

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Invasive weeds are non-native plants that invade ecosystems and replace native plants. Noxious weeds are usually invasive and designated by State law as priority plants that require control by landowners. These weeds can reduce grazing land and impact wildlife habitat. Early detection and quick response is critical to slow spread and protect weed-free areas. The purpose of this bulletin is to provide early control methods for yellow starthistle (*Centaurea solstitialis*).

This plant is a new invader to Montana and requires immediate action. If starthistle is found, immediately contact your county weed coordinator before initiating control.

Yellow starthistle (Sunflower Family) is a winter annual with a deep taproot. It is native to the Mediterranean region and was introduced to North America in contaminated seed. Flowers are bright yellow and located singly at the ends of branches. Flowers have sharp, straw-colored spines, up to 2 inches long, surrounding the base and radiating in a star shape. Stems are rigid and appear winged due to extending leaf bases. The stems of yellow starthistle are covered with cottony hairs giving a whitish appearance. Mature plants are usually 2 to 3 feet tall.

Habitat and impacts

Yellow starthistle favors disturbed sites like roadsides, ditches, waste areas, and overgrazed rangeland. When site conditions are ideal, this plant can invade excellent condition rangelands. Starthistle requires at least 10 inches of annual precipitation that peaks in winter or spring. This plant will establish on deep, well-drained soils and shallow, rocky soils. Yellow starthistle does not tolerate shade. It requires light on the soil surface for rosette and taproot development.

This weed is a serious invader. It infests over 10 million acres in California and occupies large areas in Idaho, Oregon, and Washington. Starthistle appears to be moving north and eastward. Starthistle has been reported in 8 Montana counties since 1958. New invasions were detected early and immediately eradicated. Current trends indicate yellow starthistle will continue to invade Montana. To stop spread, it is important to anticipate invasion and detect new plants early as they invade.

Biology and spread

Yellow starthistle is a rapid colonizer. It germinates quickly under most conditions. Seeds germinate in the fall and overwinter as seedlings. Rosettes form during early spring and bolt during late spring. The plants flower and produce seeds in June through August, and then lose their leaves and dry in early fall. With fall rains, seeds begin germination and the cycle is repeated. Seedbank development and a long seed life make this plant extremely difficult to control. It is important to locate new invasions prior to reproduction and seedbank development.



Yellow starthistle is adapted to open grasslands. It is expanding in rangelands by about 27,000 acres annually in the western United States.

Photo by B. Rice (TNC)

Yellow starthistle reproduces by seed. A typical plant may produce about 120 seeds. Seed viability varies with depth of burial, but may last more than 10 years. Starthistle produces plumed and plumeless seeds. Plumed seeds are parachute-like and dispersed by wind. Plumeless seeds are retained in the seed head until it disintegrates in the fall or winter. Most plumeless seeds fall within a couple feet of the parent plant. Seeds are spread to new sites in mud on boots and impure materials like mulch, forage and feed grains, crop and grass seed, top soil, and gravel. Seeds can also be transported long distances by livestock shipments, vehicles and agriculture and construction equipment.

Early control methods

Yellow starthistle is a priority for immediate eradication. Contact your county weed coordinator before applying management. Herbicides are the recommended method and most effective when applied from the rosette to the early bud stage. Hand pulling can be effective and may augment herbicide treatments. Follow-up management ensures overlooked plants are removed to prevent reinvasion. Herbicide selection and timing should be advised by your county weed coordinator and application must follow label directions. Effective herbicide treatments on sites distant from surface or ground water follow. Include surfactants to improve herbicide performance.

- Clopyralid + 2,4-D (Curtail®) applied at a rate of 2 to 4 quarts/acre.
- Clopyralid + triclopyr (Redeem®) applied at a rate of 1 quart/acre.
- Dicamba (Banvel®) applied at a rate of 1 pint/acre plus 2,4-D at a rate of 2 pints/acre.
- Picloram (Tordon®) applied at a rate of 1 to 2 pints/acre plus 2,4-D at a rate of 1½ pints/acre.
- Aminopyralid (Milestone®) applied at a rate of 3 to 5 ounces/acre.

Prevent starthistle invasion by using weed-free mulch, forage and feed grains, crop and grass seed, top soil, and gravel. Monitor sites for new weeds where at-risk material was used. Encourage outdoor users to clean equipment, remain on trails, and report new invasions. Ensure roadsides are frequently monitored as roads influence quick and distant spread of new invaders.

If you find yellow starthistle, contact your county weed coordinator or Extension agent and the Montana Department of Agriculture at (406) 444-5400.

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Photo by C. Roche

Plumed (above) and plumeless (below) seeds of yellow starthistle allow for versatility of dispersal and greater access to a variety of habitats.